

**REMARKS****Summary of the Office Action**

Claims 5-8, 13-16, 29-32 and 36-39 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,342,312 to *Oba, et al.* ("*Oba*")

Claims 2-8, 10-16, 20, and 23-32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Oba* in view of U.S. Patent No. 3,939,252 to *Pandey* ("*Pandey*") or U.S. Patent No. 4,193,783 to *Matsushita*. ("*Matsushita*")

Claims 9, 21, 22, and 33-39 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Oba* in view of *Pandey* or *Matsushita*, and further in view of U.S. Patent No. 5,319,653 to *Favennec, et al.* ("*Favennec*")

**Summary of the Response to the Office Action**

Applicant has amended claims 1-2, 4-10, 12-16, 21-22, 29-32, and 36-39 and canceled claims 3, 11, and 20. Claims 1-2, 4-10, 12-16, and 21-39 are pending for consideration.

**All Claims Comply with 35 U.S.C. § 112**

Claims 5-8, 13-16, 29-32, and 36-39 have been amended to replace the word "can be" with the word "is" Accordingly, claims 5-8, 13-16, 29-32, and 36-39 are in accordance with 35 U.S.C. § 112.

**All Claims Define Allowable Subject Matter**

Claims 1 and 21 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Oba*. Currently amended claim 1 recites “decreasing the temperature inside said container to a second temperature, which is in the range of around 600 °C to 900 °C at a rate of 2 °C/hour or less.” *Oba* does not disclose, at least, this feature. Rather, the slowest cooling described in *Oba* is 6 °C/minute. Thus, the cooling rate described in *Oba* is magnitudes higher than the cooling rate recited in claim 1. Based on *Oba*, one skilled in the art at the time of the invention would not have been motivated to experiment using the much lower cooling rates disclosed and required by the present invention. As described in preferred embodiments and comparative examples of the present application, this relatively slow cooling rate is a very important and delicate parameter for obtaining a single crystal of calcium fluoride that has a large diameter, exhibits superior optical properties, and that can be used for photolithography.

MPEP § 2143.03 points out that “To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 409 F.2d 981, 180 USPQ 580 (CCPA 1974)” Accordingly, since all of the claimed limitations are not taught or suggested by *Oba*, Applicants respectfully request that the rejection of claim 1 be withdrawn. Further, Applicants request that the rejection of currently amended claim 21 also be withdrawn because of its dependence from allowable claim 1 and for the additional features it recites.

Claims 2-8, 10-16, 20, and 23-32 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Oba* in view of *Pandey* or *Matsushita*. Claims 3, 11, and 20 have been cancelled, thus making their rejections moot. Claims 2, 4-8, 10, 12-16, and 23-32 all recite or

incorporate a cooling rate of “2 °C/hour or less,” “5°C/hour or less,” “3°C/hour or less.” or “1.2 °C/hour or less.” *Oba* and *Matsushita* do not disclose these cooling rates. Rather, as discussed above, *Oba* discloses a cooling rate magnitudes higher than the recited cooling rates. Likewise, the disclosed cooling rate of 50°C / min described in *Matsushita* is much faster than the cooling rates recited in claims 2, 4-8, 10, 12-16, and 23-32.

The annealing process described in *Pandey* refers to cooling an object from the melted state (1130°C-1250°C) through the fusion point. See col. 2, lines 44-65. In contrast, the annealing process of the present invention and recited in claims 2, 4-8, 10, 12-16, and 23-32 is performed by reheating a crystal which was already crystallized where such annealing does not pass through the fusion point of the calcium fluoride crystal. Therefore, the meaning of annealing recited in the claims and that described in *Pandey* are quite different from each other.

Moreover, *Pandey* is concerned with the compositional formula  $\text{Li}_2\text{Gd}_4(\text{MoO}_4)_7$ , while the present invention and claims pertain to calcium fluoride. *Matsushita* pertains to a silicon single crystal ingot rather than the claimed calcium fluoride crystal. Therefore, *Pandey* and *Matsushita* teach that the annealing process is applied to a completely different object than the calcium fluoride crystal recited in the claims, and therefore the annealing processes are not comparable.

MPEP § 2143.01 instructs that “[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ 2d 1430 (Fed. Cir. 1990).” MPEP § 2143.01 further instructs that “[a]lthough a prior art device ‘may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so.’”

Because of the vast differences between the objects to which the annealing process is applied, it would not be obvious to one skilled in the art at the time of the invention to combine the teachings of *Pandey* or *Matsushita* with *Oba* to derive the invention claimed in the present application. Further, the annealing rates of *Oba* and *Matsushita*, and the annealing process of *Pandey*, all differ from that of the claimed invention. As such, Applicants respectfully request that the rejection of claims 2, 4-8, 10, 12-16, and 23-32 be withdrawn.

Claims 9, 21, 22, and 33-39 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Oba* in view of *Pandey* or *Matsushita*, and further in view of *Favennec*. As described above, Applicants note that the objects to which an annealing process are applied in *Oba*, *Matsushita*, and *Pandey*, are different from each other. Further, *Favennec* pertains to an integrated optical component structure for fluorescent wavelength, and therefore also differs from the objects disclosed in *Oba*, *Pandey*, and *Matsushita*. Because of the differences between the objects to which the annealing process is applied, it would not be obvious to one skilled in the art at the time of the invention to combine the teachings of *Pandey*, *Matsushita*, and/or *Favennec* with *Oba* in order to derive the invention claimed in the present application. As such, Applicants respectfully request that the rejection of claims 9, 21-22, and 33 be withdrawn. Further, Applicants request that the rejection of claims 34-39 also be withdrawn at least because of their dependence from allowable claim 33 and for the additional features they recite.

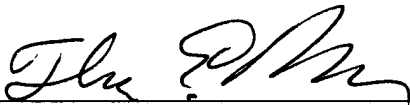
In view of the foregoing, Applicants respectfully request reconsideration and timely allowance of the pending claims. Should the Examiner believe that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicant's undersigned representative to expedite prosecution.

If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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